

WHAT IS CLAIMED IS:

1. A transmission apparatus of orthogonal frequency division multiplexing for multiplexing a plurality of carriers orthogonal to one another for transmitting signals, including a transmission side and a reception side, said transmission side comprising:

an input terminal, to which information codes are applied;

a first modulator coupled with said input terminal for outputting first signals modulated in accordance a modulation scheme which can be applied with a synchronous detection for demodulation in said reception side;

a second modulator for outputting second signals modulated in accordance with a modulation scheme different from the modulation scheme associated with said first modulator circuit; and

a transmission unit including a distributing circuit coupled with said first and second modulators for distributing said first and second signals modulated by said first and second modulator circuits to a plurality of predetermined carriers, respectively, wherein said distributing circuit distributes said second signals modulated by said second modulator circuit to all or some of carriers existing within a predetermined number of columns from at least one of both end regions of a signal transmission frequency band, and said first signals modulated by said first

modulator to the remaining carriers, and outputting the modulated signals.

2. An apparatus according to claim 1, wherein said end regions are an end region on the lower frequency side and an end region on the higher frequency side of said transmission frequency band.

3. An apparatus according to claim 1, wherein said carriers distributed with said second signals modulated by said second modulator circuit are some or all of carriers except for carriers used for reproducing reference signal vectors for use in demodulating modulated signals of carriers modulated in accordance with said modulation scheme which can be applied with the synchronous detection.

4. An apparatus according to claim 3, wherein the modulation scheme associated with said second modulator is a differential modulation scheme.

5. An apparatus according to claim 3, wherein the modulation scheme associated with said second modulator is a modulation scheme which can be applied with a synchronous detection having a smaller number of multilevel than a number of multilevel in the modulation scheme associated with said first modulator which can be applied with the synchronous detection.

6. An apparatus according to claim 5, wherein the modulation scheme associated with said second modulator is one of QPSK, 16QAM and 32QAM schemes when the modulation scheme associated with said first

modulator is 64QAM.

7. A transmission apparatus of orthogonal frequency division multiplexing for transmitting a signal on which a plurality of carriers are multiplexed, said carriers being orthogonal to one another, said transmission apparatus comprising:

a first error correction coding circuit for converting a first code to a first error correction code;

a second error correction coding circuit for converting a second code to a second error correction code which has error correcting performance higher than said first error correction code;

a first modulator for outputting a signal modulated with said first error correction code in accordance with a modulation scheme which can be applied with a synchronous detection for demodulation;

a second modulator for outputting a signal modulated with said second error correction code in accordance with a predetermined modulation scheme; and

a distributing circuit for distributing the signal modulated by said first modulator and the signal modulated by said second modulator to a plurality of predetermined carriers, said distributing circuit distributing the signal modulated by said second modulator to all or some of carriers existing within a predetermined number of columns from at least one of both end regions of a signal transmission frequency

band, and assigning the signal modulated by said first modulator to the remaining carriers.

8. An apparatus according to claim 7, wherein said end regions are an end region on the lower frequency side and an end region on the higher frequency side of said transmission frequency band.

9. An apparatus according to claim 7, wherein the carriers distributed to the signal modulated by said second modulator are some or all of carriers except for carriers used for reproducing reference signal vectors for use in demodulating said information code.

10. An apparatus according to claim 7, wherein said second error correction code is a  $1/2$  convolutional code when said first error correction code is a  $3/4$  convolutional code.

11. A transmission/reception system of orthogonal frequency division multiplexing having a transmitter for transmitting a signal on which a plurality of carriers are multiplexed, said carriers being orthogonal to one another, and a receiver for receiving and demodulating a transmitted signal, wherein said transmitter comprises:

a first modulator for outputting a code modulated in accordance a modulation scheme which can be applied with a synchronous detection for demodulation;

a second modulator for outputting a code

modulated in accordance with a modulation scheme different from the modulation scheme associated with said first modulator; and

a distributing circuit for distributing the codes modulated by said first and second modulator to a plurality of predetermined carriers, wherein said distributing circuit distributes the code modulated by said second modulator to all or some of carriers existing within a predetermined number of columns from at least one of both end regions of a signal transmission frequency band, and the code modulated by said first modulator to the remaining carriers.

12. A transmission/reception system of orthogonal frequency division multiplexing having a transmitter for modulating a plurality of carriers with a plurality of signals to transmit the signals, said carriers being orthogonal to one another, and a receiver for receiving and demodulating a transmitted signal, wherein said transmitter comprises:

a first error correction coding circuit for converting a first code to a first error correction code;

a second error correction coding circuit for converting a second code to a second error correction code which has error correcting performance higher than said first error correction code;

a first modulator for outputting a signal modulated with said first error correction code in

accordance with a modulation scheme which can be applied with a synchronous detection for demodulation;

a second modulator for outputting a signal modulated with said second error correction code in accordance with a predetermined modulation scheme; and

a distributing circuit for distributing the signal modulated by said first modulator and the signal modulated by said second modulator to a plurality of predetermined carriers, said distributing circuit distributes the signal modulated by said second modulator to all or some of carriers existing within a predetermined number of columns from at least one of both end regions of a signal transmission frequency band, and assigning the signal modulated by said first modulator to the remaining carriers.